Chapter Five

Understanding Ammunition

Learning Objectives

At the end of this chapter, you will be able to:

A. Identify the different parts of rifle and shotgun ammunition.

B. Explain how ammunition works.

C. Choose the right ammunition for your firearm.

D. Choose the proper ammunition for the game you are hunting.

E. Approximately determine the range of different types of shotgun and rifle ammunition and discuss factors that affect it.

Introduction

You've been given a rifle for big-game hunting and a shotgun for duck hunting. You go back to the local gun shop to buy ammunition. The clerk asks you, "What caliber or gauge do you need?" The store has a great variety of ammunition to choose from. Before you hunt, it is important that you pick the right caliber or gauge, and the right bullet or shot size for the animals you intend to hunt. What will you buy?

It's important to understand the basics of ammunition and ammunition safety to prevent accidents. Modern ammunition varies in size, appearance, materials and parts, and the variety can be confusing for a beginner. Choosing the right ammunition is a matter of matching the ammunition to the firearm as well as to the type of game you are hunting.

A. Ammunition: the basic parts

Rifle cartridges and shotgun shells have similar designs, share the same basic parts, depend on the same physical and chemical reactions to work, but are used for different purposes.

Rifle cartridges

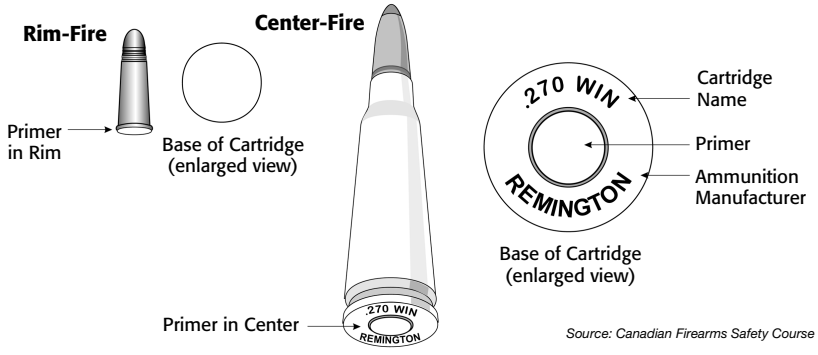
The basic parts of modern rifle ammunition are the **case**, **primer**, **powder** and **projectile (bullet)**. Look at the diagrams to locate each part. Be sure to notice the relationship of each part to the others since this can help you understand how the ammunition works.

The location of the primer tells you if a cartridge is **rim-fire** or **center-fire**. Generally, center-fire cartridges are more powerful than rim-fire cartridges. Large-caliber rifles and all shotguns use center-fire ammunition.

Key Words

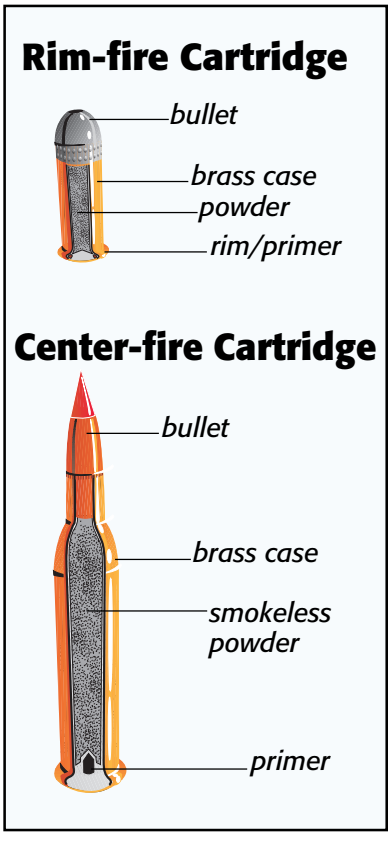
Ammunition	**Bullet**	**Caliber**
Trajectory	**Shotshell**	**Gauge**
Rifle cartridge	**Lead shot**	**Data stamp**

- The **center-fire** cartridge has a primer located in the center of the base.
- The **rim-fire** cartridge has no noticeable primer. Instead, the priming compound is embedded in the case rim. When the rim is struck by the firing pin, the priming compound explodes, igniting the powder.



Source: Canadian Firearms Safety Course

Rifle Ammunition



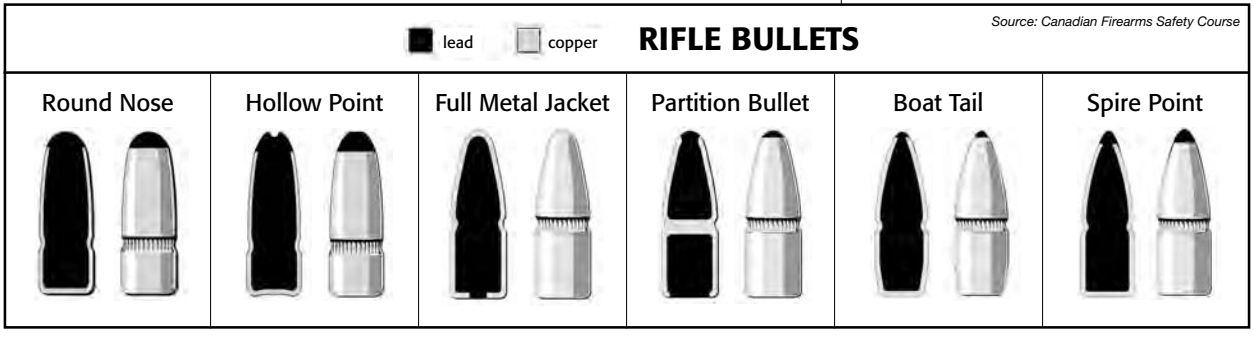
Bullets

Bullets come in different shapes and sizes and are commonly made of lead and copper.

Bullet weight. In addition to the caliber of your ammunition, you must also decide on weight. The weight of a bullet is expressed in grains. Generally, the heavier the bullet the more killing power it delivers.

Modern bullets are designed for particular sizes of game animals. It is possible, for example, to choose a bullet weight that is too light for large game. If the weight is incorrect you may end up wounding the animal rather than killing it quickly.

Bullet trajectory. Changing the weight of your bullet changes its **trajectory**. Trajectory is the path a bullet takes during flight. Several factors affect this path: gravity, air resistance, speed and weight of the bullet. Gravity pulls the bullet down as it travels

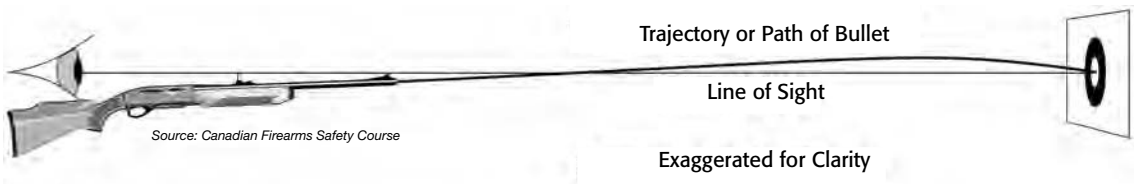


Source: Canadian Firearms Safety Course

forward which results in a downward curved flight path. The air provides resistance that slows the flight of the bullet.

Of course, a bullet travels much too quickly for you to be able to actually see its trajectory. You can see an example of a trajectory though by simply throwing a ball in the air and watching it come down.

The trajectory of a bullet is slightly curved. So, if you sight in your firearm to hit a target at 200 yards, you will hit your target high at 100 yards and low at 300 yards.



Since the trajectory of a bullet depends in part on its weight, you must carefully consider your weight choice. For example, a .30-06 Springfield cartridge with a 180-grain bullet has a different flight pattern than the same cartridge with a 150-grain bullet. Once you make your selection, practice sighting in your rifle using that ammunition before you head into the field.

Shotgun shells

Shotshell Boxes

The shotshell is made up of five basic parts — one more than the rifle cartridge. Four parts of the shotshell are the same as the rifle cartridge — case, primer, powder and projectile (shot). But the shotshell has a fifth part: the wad. The job of the wad is to keep the shot charge separate from the powder.

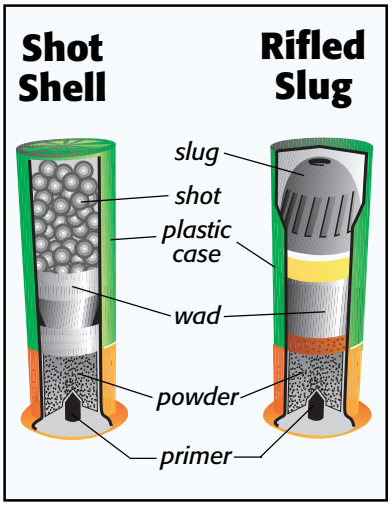
Each gauge of shotgun requires a specific shotshell. For example, a 12-gauge shotgun requires a 12-gauge shotshell, a 16-gauge shotgun requires a 16-gauge shotshell. Make sure the gauge of your shotgun matches the gauge marked on the shotshell. The gauge is also printed on the box in which shells come from the factory.

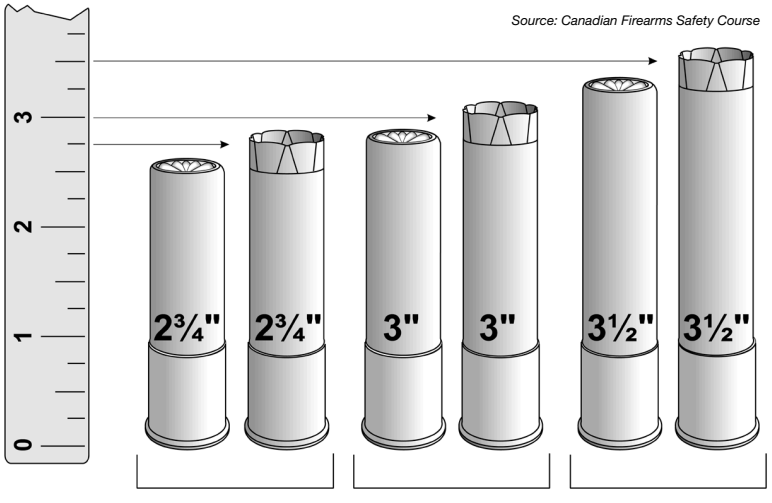
Shot size. Shot comes in various sizes. The sizes are numbered, BUT the larger the number, the smaller the size of the shot. So for example, No. 9 shot is very small while No. 000 shot is large. Choose the right shot size for the animals you are hunting. As a general rule, the smaller the game, the smaller the shot pellets need to be. Some big game species may be hunted using shot or slugs. Check Montana's hunting regulations before you choose your ammunition!

BEWARE: Ammunition can sometimes be put into the wrong box. Always look at the data stamp on the shell to make sure you are using the correct ammunition!

Load. You can buy the same gauge shotshells with various powder charges. The boxes may be marked target, field or magnum load. Magnum loads have more powder and more shot than target or field loads. A 12-gauge 2¾-inch magnum shell, for example, will contain ¼ to ½ ounce more shot than a standard shell of the same size and gauge. Magnum shells are often longer than standard shells.

Length. The length of a shotshell is normally given in inches and is based on the length of the spent hull. Common lengths for 12-gauge shells are 2¾, 3 and 3½ inches. **Warning:** The new 3-inch and 3½-inch shells will not work in a shotgun made for 2¾-inch shells.





12 Gauge Shotgun Shells Unfired and Fired

B. How ammunition works

Rifle cartridges and shotgun shells both depend on the same physical and chemical reactions to operate. When a firearm's firing pin strikes the cartridge primer, it causes a small explosion that ignites the powder in the cartridge case. The burning creates a hot gas that causes pressure to build up inside the cartridge. When the hot gas pressure reaches a certain force, it propels the bullet or shot (the projectile) from the end of the cartridge case and out through the end of the barrel. This all happens in a tiny fraction of a second.

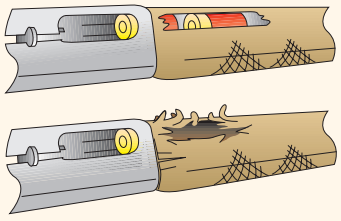
Nontoxic Shot

Due to environmental concerns, the use of lead shot for waterfowl hunting is prohibited. The shot that does not end up in the game, ends up at the bottom of lakes and rivers. Ducks and geese can swallow the lead pellets when feeding and become poisoned. For all waterfowl hunting and some upland bird hunting, you must use nontoxic (non- lead) shot. Check the specific regulations of the area where you are hunting.

Nontoxic shot can be made of bismuth, steel, tin, tungsten-iron, tungsten-matrix, or tungsten-polymer materials. Nontoxic shot has different properties and ballistics than lead shot and a switch to nontoxic shot requires some adjustment and practice.

Warning!

The danger of using the wrong ammunition



Never carry different calibers/gauges of ammunition on your person.

If you accidentally put a 20-gauge shell in a 12-gauge firearm, the shell will slide part way down the barrel. If the firearm is then loaded with a 12-gauge shell and fired, it is almost certain to destroy the firearm and probably cause serious injury.

C. Choosing the right ammunition for your firearm

Only one size of ammunition properly fits any firearm. Putting any other size cartridge into a firearm is extremely dangerous. The best way to make sure you are putting the correct ammunition into your firearm is to match the data stamp on the barrel of your firearm to the similar data stamp on the head of the rifle cartridge or shotshell. Be particularly careful with hand-loaded ammunition as it could be mis-marked (.30-06 made into .270).

Caliber and gauge

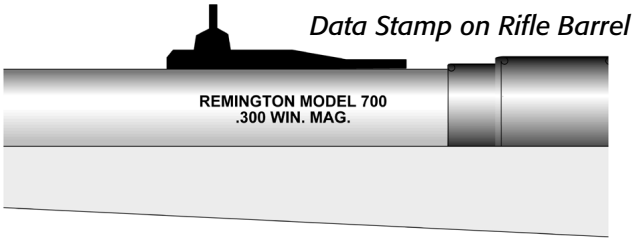
Ammunition comes in different lengths, shapes, and diameters depending on the type of bullet or case used. You must choose a caliber or gauge that is suited to your firearm as well as the game you wish to hunt.

The data stamp

First, you must know the caliber or gauge of the firearm for which you are buying ammunition. To find that out, locate the data stamp on the barrel of your firearm. Does the data stamp on the ammunition match the data stamp on the barrel? If you are not sure always get help from a knowledgeable person. It is easy to be confused by all the different ammunition. Ask someone who is experienced and is familiar with your firearm to help you select the correct ammunition.

If you do not match the ammunition to the firearm, the cartridge could become lodged, explode and cause serious injury to the user or a bystander. If the data stamp on the firearm does not match the data stamp on the ammunition, do not use the ammunition.

Data Stamp on Rifle Barrel



Source: Canadian Firearms Safety Course

BEWARE: Ammunition can sometimes be put into the wrong box. Always look at the data stamp on the shell to make sure you are using the correct ammunition!

D. Choosing the right ammunition for your game

Once you've matched the ammunition to your particular firearm, you must then select the proper size and type for the game you are hunting. Again, a knowledgeable and experienced hunter can help you with your selection.

Your ammunition must be heavy enough and fast enough to kill with one shot, but it must not be too large for your game.

Following are two tables. One table provides general guidelines for matching game, shot size and shotgun gauge. The other table provides a very general set of guidelines for matching game with bullet weight and rifle caliber.

E. How far will a bullet or shot travel?

The size of the bullet or shot, the type and amount of powder, the type of firearm and its barrel length all affect the distance a

Game, Bullet Weight & Rifle Caliber

Description	Bullet Weight in Grains	Deer	Black Bear	Antelope	Bighorn Sheep	Mountain Goat	Moose	Elk	Fox	Coyote
.22 Rimfire	40									
.222 Rem	50								•	•
.22-250 Rem	55								•	•
.243 Win	75 100	• •	• •	• •					•	•
.25-06 Rem	120	•	•	•	•				•	•
.25-35 Win	117	•	•							
.250 Savage	100	•	•	•					•	•
.270 Win	130 150	• •	• •	•	• •	• •	• •	• •	•	•
7x57 mm Mauser	139 160	• •	• •	•	• •	• •	• •	• •	•	•
7mm Rem Mag	175	•	•		•	•	•	•		
.30-.30 Win	150 170	• •	• •						•	•
.30-06 Springfield	150 180 220	• • •	• • •	• • •	• • •	• • •	• • •	• • •	•	•
.300 Win Mag	180				•	•	•	•		
.300 Savage	150 180	• •	• •	•	• •	• •	• •	• •	•	•
.303 Savage	190	•	•							
.303 British	150 180 215	• • •	• • •	• • •	• • •	• • •	• • •	• • •	•	•
.308 Win	150 180	• •	• •	• •	• •	• •	• •	• •	•	•
.32 Win Spec	170	•	•							

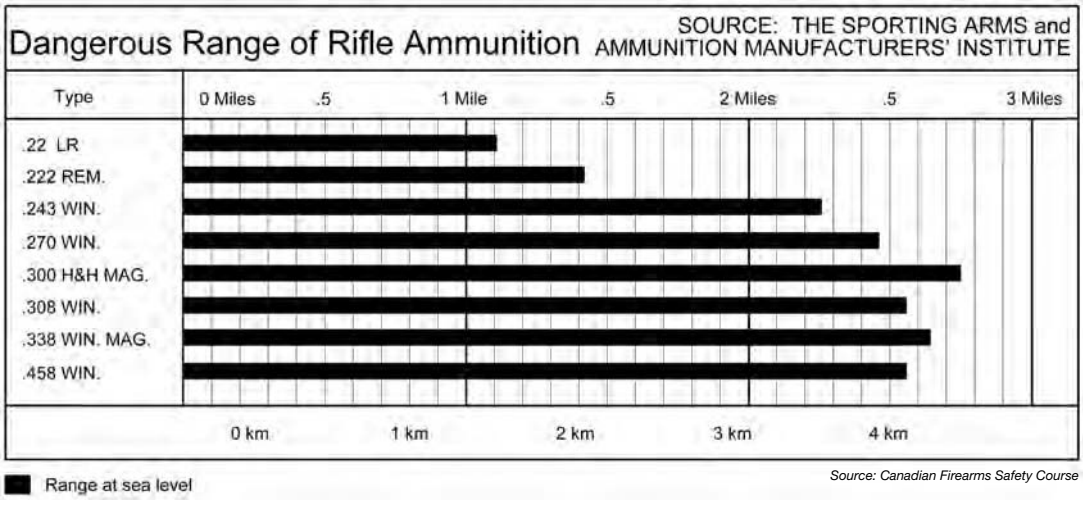
For general reference only

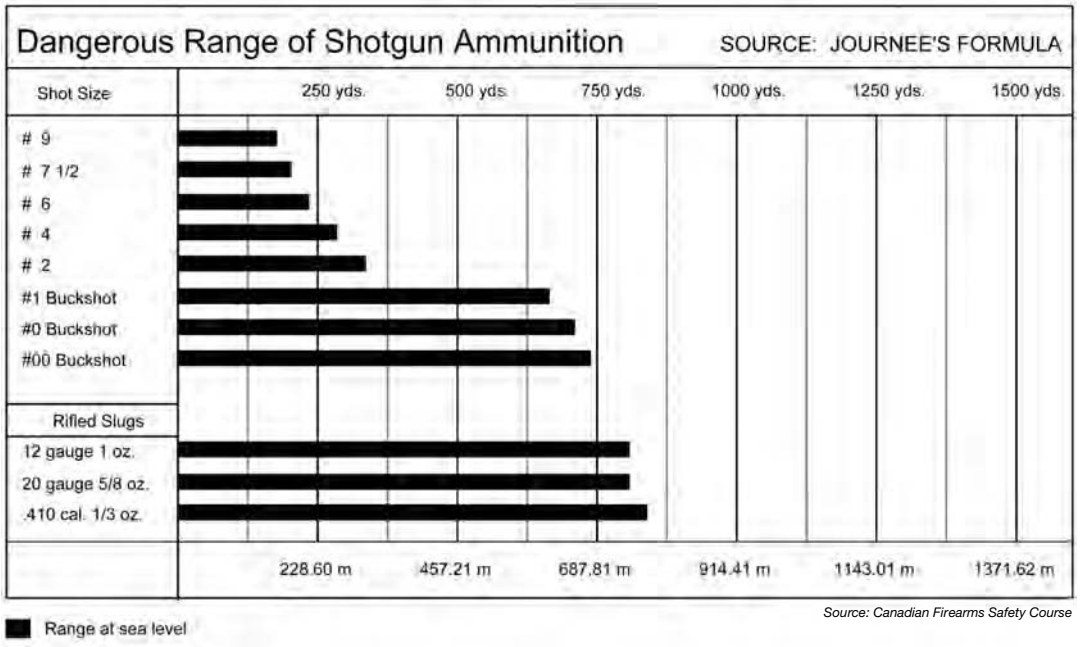
Game, Shot Size & Shotgun Gauge

Game	Shot Size	Recommmended Gauge
Geese	Steel T, BBB, BB 1, 2	10, 12
Ducks	Steel 1, 2, 3, 4, 6	10, 12, 20
Turkey	Lead 4, 5, 6	10, 12, 16, 20
Pheasant	Lead 4, 5, 6, 7½ Steel 4, 6	12, 16, 20 12, 20
Grouse	Lead 5, 6, 7½, 8	12, 16, 20, 28
Partridge	Lead 5, 6, 7½, 8	12, 16, 20, 28
Snipe	Steel 4, 6, 7	12, 20
Dove	Lead 7½, 8 Steel 4, 6, 7	12, 16, 20, 28, 410 12, 20
Rabbit	Lead 4, 5, 6, 7½	12, 16, 20, 28, 410

projectile will travel. A shotgun cannot shoot as far as a rifle. Bear in mind, however, that even though a shotgun is *effective* and *accurate* up to about 40 or 50 yards, the shot can travel as far as 300 yards. Rifle bullets, on the other hand, can travel several miles. If you miss your target, do you know where your bullet might go?

The charts below give you some idea of how far your ammunition might travel.





NOTE: Steel, bismuth and tungsten-iron pellets of the same size have a shorter range

Chapter Five Quiz

1. To determine the appropriate gauge and length of the shell for a shotgun, look on the: (Mark the correct answer.)

   _____ action

   _____ barrel

   _____ stock

   _____ shell

2. Ammunition should be: (Mark the correct answer(s).)

   _____ locked up and stored separately from firearms.

   _____ sorted and stored by caliber or gauge.

   _____ matched and used with the appropriate firearm.

   _____ all of the above.

3. Which of the following components is NOT found in a centerfire rifle cartridge? (Mark the correct answer.)

   _____ case

   _____ powder

   _____ primer

   _____ wad

4. You have sighted in your hunting rifle using ammunition with a 150-grain bullet. You plan to go moose hunting and have purchased ammunition with a 180-grain bullet. Should you sight in your hunting rifle again? (Choose the correct answer.)

   _____ yes

   _____ no